**Amendments to the Claims:**

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of correcting coordinate measurement errors produced by ~~the position measuring devices of coordinate measuring machines due to vibrations of~~dynamic forces distorting parts of the machine comprises the steps of:

measuring the accelerations of a moving part of the machine,

~~producing~~ using the position measuring devices of the machine to obtain signals indicative of the displacement of the machine part ~~from~~,

~~using~~ applying a data fusion algorithm ~~processing the two displacement signals so~~to obtain ~~to~~ corrected ~~the measured~~ values ~~of~~ for the measured displacement ~~produced by the machine for vibrations~~ of the moving part wherein the data fusion algorithm double integrates the measured acceleration values to produce signals indicative of the displacement of the machine part due to the accelerations and combines the produced signal with the signals indicative of the displacement of the moving part.

2. (Original) A method according to claim 1, wherein the accelerations of said moving part are measured along a linear axis of the machine.

3. (Original) A method according to claim 1, wherein the accelerations of said moving part are angular accelerations.

4. (Original) A method according to claim 1 wherein the step of measuring the accelerations of a moving part of the machine includes measuring the accelerations both of the moving part and of at least one of said position measuring devices along an axis of the machine, and the step of double integrating the difference between the accelerations of the moving part and of the position measuring device in the direction of said axis.

5. (Currently Amended) A method according to claim 1, wherein the data fusion algorithm includes a scaling step whereby displacement signals produced by double

integration of the measured acceleration values are processed in a scaling matrix in order to produce data with the same measurement units as those produced by the measuring devices of the machine.

6. (Currently Amended) A method according to claim 1, wherein the data fusion algorithm includes a filtering step whereby the signals indicative of the displacement of the moving part of the machine due to the accelerations thereof are filtered through a high pass filter ~~before being processed using the data fusion algorithm~~.

7. (Currently Amended) A method according claim 1, wherein the data fusion algorithm includes a filtering step whereby the signals indicative of the displacement of the machine produced by the position measuring devices of the machine are filtered through a low pass filter ~~before being processed by the data fusion algorithm~~.

8. (Currently Amended) A method according to claim 1, wherein both the linear and angular accelerations of the moving part are measured and the angular accelerations of the data fusion algorithm processes the moving part ~~are used~~ to calculate a direction matrix which describes the orientation of the axes of the linear accelerometers relative to the linear axes of the machine.

9. (Original) A method according to claim 1 wherein the moving part of the machine comprises a measuring probe carried by the machine.

10. (Original) A method according to claim 1 wherein the moving part of the machine comprises a probe head carried by the machine and to which a measuring probe is connected.

11. (New) A method according to claim 4, wherein the data fusion algorithm includes the step of double integrating the difference between the accelerations of the moving part and of the position measuring device in the direction of said axis.

12. (New) A data fusion algorithm for correcting measurement errors produced by position measuring devices on a movable machine part comprising the steps of:

(a) inputting a first signal which is indicative of the accelerations of a moving part of a machine;

(b) integrating the first signal twice to obtain a displacement signal indicative of displacement of the moving part caused by acceleration effects of a movement;

(c) normalizing and resolving the doubly integrated first signal;

(d) inputting a second signal which is indicative of a displacement of the movable machine part caused by the movement;

(e) adding the normalized and resolved first signal to the second signal to produce a position signal.

13. (New) A data fusion algorithm according to claim 12 including a filtering step whereby the signals indicative of the displacement of the moving part of the machine due to the accelerations thereof are filtered through a high pass filter prior to being added to the second signal.

14. (New) A data fusion algorithm according to claim 13 comprising:

inputting a third signal which is indicative of the accelerations of the position measuring device; on a movable machine Part then it is same as 1st signal –

integrating the third signal twice to obtain a displacement signal indicative of displacement of the position measuring device caused by acceleration effects of a movement;

normalizing and resolving the third signal;

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inverting the normalized and resolved third signal; and

adding the inverted third signal to the normalized and resolved first signal.

15. (New) A data fusion algorithm according to claim 12 including the steps of:

inputting a third signal which is indicative of the accelerations of the position measuring device; and on a movable machine Part

subtracting the third signal from the first signal prior to integrating the first signal twice.

16. (New) A data fusion algorithm according to claim 12 comprising:

inputting a fourth signal indicative of angular accelerations of the moving part caused by acceleration effects of a movement;

creating a direction matrix which describes the orientation of the moving part with respect to an axis of the machine;

applying the direction matrix between steps (a) and (b) to transform translational acceleration information of the moving part into the linear axes of the machine.

17. (New) A data fusion algorithm according to claim 16 wherein the fourth signal is additionally integrated twice and scaled to give a signal indicative of displacement of the moving part from a nominal center.

18. (New) A data fusion algorithm according to claim 17 comprising:

inputting a fifth signal indicative of angular acceleration of the moving part caused by internal torque;

integrating the fifth signal twice to obtain a rotational displacement signal indicative of the displacement of the moving part caused by internal torque during a movement;

adding the doubly integrated fifth signal to the fourth signal.

19. (New) A coordinate measuring machine controller programmed to run a data fusion algorithm according to claim 12.

20. (New) A program for a coordinate measuring machine controller which operates in accordance with a data fusion algorithm according to claim 12.

19 A data fusion algorithm according to claim 12 wherein a coordinate measuring machine controller programmed to run a data fusion algorithm.

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**Amendments to the Drawings**:

The attached replacement drawing sheets make changes to Figs. 1a and 4b, and replace the original sheets with Figs. 1a and 4b.

Attachment: Replacement Sheets